

A mass attached to a spring oscillates with a period of 3.15 s.

1) If the mass starts from rest at $x = 0.0440 \text{ m}$ at $t = 0$, where is it at $t = 6.375$?

2) Is the mass moving in the positive or negative direction at $t = 6.375$?

$$1) x = A \cos\left(\frac{2\pi}{T} t\right) \quad \& \quad x = A \text{ at } t = 0 \text{ use cosine}$$

$$x = 0.0440 \text{ m} \cos\left(\frac{2\pi}{3.15 \text{ s}} 6.375\right)$$

$$= \boxed{4.36 \text{ E} - 2 \text{ m}}$$

$$\frac{\text{Total time}}{T} = \frac{6.375}{3.155} = 2.02$$

The mass is just beginning a new cycle, so it is moving in the negative direction.